CHAPTER 2

Managing ACE Software Licenses

This chapter describes how to manage the software licenses for your Cisco 4700 Series Application Control Engine (ACE) appliance. It contains the following major sections:

- Information about ACE Licenses
- Guidelines and Limitations
- Prerequisites
- Default Feature Capabilities
- Managing ACE Appliance Software Licenses
- Displaying ACE License Configurations and Statistics

Information about ACE Licenses

Table 2-1 summarizes the contents of the ACE 4710 license bundles available in software release A4(2.0) and later. You can increase the performance and operating capabilities of your ACE by purchasing one of these license bundles. Note that the number of application acceleration connections is always 100 regardless of the bandwidth of the installed license bundle.

Table 2-1 ACE 4710 License Bundles

License Bundle	Product ID (PID)	License File	Description
0.5 Gbps Bundle	ACE-4710-0.5-K9	ACE-4710-0.5-K9	0.5 Gbps bandwidth 2.0 Gbps compression 7500 TPS SSL 20 virtual contexts
0.5 Gbps to 1 Gbps 1 Gbps Bundle	ACE-4710-BUN-UPG1= ACE-4710-01-K9	ACE-4710-BUN-UPG1 ACE-4710-01-K9	1 Gbps bandwidth 2.0 Gbps compression 7500 TPS SSL 20 virtual contexts
1 Gbps to 2 Gbps 2 Gbps Bundle	ACE-4710-BUN-UPG2= ACE-4710-02-K9	ACE4710-BUN-UPG2 ACE-4710-02-K9	2 Gbps bandwidth 2.0 Gbps compression 7500 TPS SSL 20 virtual contexts

Table 2-1 ACE 4710 License Bundles (continued)

License Bundle	Product ID (PID)	License File	Description
2 Gbps to 4 Gbps 4 Gbps Bundle	ACE4710-BUN-UPG3= ACE-4710-04-K9	ACE4710-BUN-UPG3 ACE-4710-04-K9	4 Gbps bandwidth 2.0 Gbps compression 7500 TPS SSL 20 virtual contexts
1 Gbps Bundle (covers two ACE Appliances)	ACE-4710-2PAK	ACE-4710-2PAK	1 Gbps bandwidth 2.0 Gbps compression 7500 TPS SSL 20 virtual contexts

Guidelines and Limitations

The ACE license guidelines and limitations are as follows:

- A demo license is valid for only 60 days. At the end of this period, you must update the demo license with a permanent license to continue to use the ACE software. To view the expiration of a demo license, use the **show license usage** command in Exec mode (see the "Displaying ACE License Configurations and Statistics" section). ACE demo licenses are available through your Cisco account representative.
- If you turn the clock backward for any reason, you will not be able to install a demo license.
- If you need to replace an ACE, you can copy and install the license file for the license into the replacement ACE.
- If you are upgrading a redundant configuration from software version A4(1.0) to software version A4(2.0), while the two ACEs are in split mode with software version A4(1.0) running on the active ACE and software version A4(2.0) running on the standby, config sync is disabled because of a license incompatibility. If you make any configuration changes on the active ACE during this time, your changes are not synchronized to the standby and are lost. After you complete the upgrade, config sync is automatically reenabled. We recommend that you do not make any configuration changes while the two ACEs are in split mode.

Prerequisites

You must have the Admin role in the Admin context to install, remove, and update the license file.

Default Feature Capabilities

Table 2-2 lists the default feature capabilities of the ACE.

Table 2-2 Default Feature Capabilities

Parameter	Default
Virtual Contexts	One Admin context, 20 virtual contexts
Bandwidth	1.0 Gbps

Table 2-2 Default Feature Capabilities

Parameter	Default
Secure Sockets Layer (SSL)	7,500transactions per second (TPS)
Hypertext Transfer Protocol (HTTP) compression	2.0 Gbps
Application Acceleration Connections	100[1]

1. Application acceleration connections are fixed at 100 concurrent connections in software release A4(2.0) for all license bundles.

Managing ACE Appliance Software Licenses

This section includes the following topics:

- Tasks for Ordering an Upgrade License and Generating a Key
- Copying a License File to the ACE
- Installing a New or Upgrade License File
- Replacing a Demo License with a Permanent License
- Removing a License Bundle or All License Bundles from the ACE
- Backing Up an ACE License File
- Retrieving an ACE License File

Tasks for Ordering an Upgrade License and Generating a Key

This section describes the process that you use to order an upgrade license and to generate a license key for your ACE.

Follow these steps to order an upgrade license:

Step 1 Order one of the licenses from the list in the "Information about ACE Licenses" section using any of the available Cisco ordering tools on cisco.com.

Step 2 When you receive the Software License Claim Certificate from Cisco, follow the instructions that direct you to the Cisco.com website. As a registered user of Cisco.com, go to this URL:

http://www.cisco.com/go/license

Step 3 Enter the Product Authorization Key (PAK) number found on the Software License Claim Certificate as your proof of purchase.

Step 4 Provide all the requested information to generate a license key.

After the system generates the license key, you will receive a license key e-mail with an attached license file and installation instructions.

Step 5 Save the attached license file to a remote server that you can access from the ACE. Save the license key e-mail in a safe place in case you need it in the future (for example, to transfer the license to another ACE).

What to Do Next

Copy the license file to the ACE (see the "Copying a License File to the ACE" section).

Copying a License File to the ACE

This section describes how to copy an ACE license file from a remote server to the ACE. For detailed information on copying files from a remote server, see Chapter 4, Managing the ACE Software.

Prerequisites

The license file must reside on a remote server that you can access from the ACE.

You must be in the Admin context to copy the file to disk0: on the ACE.

Detailed Steps

Command	Purpose
copy tftp:[//server[/path/][/filename]] **disk0:**[path/]filename **Example:** host1/Admin# copy tftp://track/license/ACE-4710-02-K9.lic disk0:	Copies the file to disk0: on the ACE. The arguments and keywords are as follows: • [*//server*[*/path/*][*/filename*]]—The path to the network server. This path is optional because the ACE prompts you for this information if you omit it. • **disk0:**[*path/*]*filename*—Specifies that the file destination is the disk0: directory of the current context and the filename. If you do not provide the optional path, the ACE copies the file to the root directory on the disk0: file system.

What to Do Next

If the license is a demo or permanent license for a new or upgrade installation, see the "Installing a New or Upgrade License File" section.

If the license is a permanent license replacing a demo license, see the "Replacing a Demo License with a Permanent License" section.

Installing a New or Upgrade License File

This section describes how to install a license after you copy a demo or permanent license file to the ACE for a new or upgrade installation (see the "Copying a License File to the ACE" section). All license installations except one have no adverse impact to an operating ACE. No reboot is required and existing connections are not interrupted. In a redundant configuration, mismatched context licenses between the active and the standby ACEs cause the active ACE to generate a syslog message (if logging is enabled) and to disable configuration synchronization. After you install the correct matching license on the standby ACE, the software automatically detects the new license and restores normal operation.

For information about replacing a demo license with a permanent one, see the "Replacing a Demo License with a Permanent License" section.

Restrictions

This topic includes the following restrictions:

- You must have the Admin role in the Admin context to install or upgrade the license file.
- If you install a context demo license, make sure that you save the Admin running configuration and all user context running configurations to a remote server. If you allow a context license to expire, the ACE automatically removes all user contexts from the Admin running configuration and all configurations for the user contexts.

Detailed Steps

Command	Purpose
license install disk0:[*path/*]*filename* [*target_filename*] **Example:** host1/Admin# license install disk0: ACE-4710-02-K9.lic	Installs or upgrades a license on your ACE. The arguments are as follows: • [*path/*]*filename*—License stored on the disk0: file system. If you do not specify the optional path, the ACE looks for the file in the root directory. • *target_filename*—(Optional) Target filename for the license file.
show license brief **Example:** host1/Admin# show license brief	(Optional) Displays the installed licenses.

Examples

To install a license bundle for 2 Gbps bandwidth, 2 Gbps compression, 7500 TPS SSL, 20 virtual contexts, and 200 app. accel. conns, enter:

```
host1/Admin# license install disk0:ACE-4710-02-K9.lic
```

Replacing a Demo License with a Permanent License

This section describes how replace an ACE demo license with a permanent license. If you installed a demo license, four weeks before the license expires, the ACE generates warning syslog messages once a day. During the final week, a warning syslog message occurs once an hour. Before this period ends, you must update the demo license with a permanent license. Otherwise, the ACE will revert to its previous bandwidth, SSL TPS, or number of contexts.

After you copy the permanent license file to the ACE (see the "Copying a License File to the ACE" section), you can install it.

Restrictions

This topic includes the following restrictions:

- You must have the Admin role in the Admin context to update the demo license file with a permanent file.

- If you replace the context demo license with a permanent license, you can continue to use the configured user contexts on the ACE. However, if you allow a context license to expire, the ACE automatically removes all user contexts from the Admin running configuration and all configurations for the user contexts. Before a context license expires, save the Admin running configuration and the user context running configurations to a remote server. To view the expiration of the demo license, use the **show license usage** command in Exec mode from the Admin context.
- You must replace a demo license with a permanent license that has the same feature capability. For example, if you want to replace a 4 Gbps demo license, you can replace it only with a permanent 4 Gbps license.

Detailed Steps

Command	Purpose
license update disk0:[*path/*]*permanent_filename demo_filename* **Example:** host1/Admin# license update disk0:ACE-AP-VIRT-020.lic ACE-4710-02-K9-DEMO.lic	Replaces a demo license with a permanent license. The arguments are as follows: • [*path/*]*permanent_filename*—Filename for the permanent license file that you copied onto the ACE. • *demo_filename*—Filename for the demo license file that the permanent license file is replacing.

Removing a License Bundle or All License Bundles from the ACE

This section describes how to remove a license bundle or all licenses from the ACE.

Note When you use the **clear startup-config** or the **write erase** command, the ACE does not remove license files from the startup-configuration file.

Prerequisite

Caution Before you remove any license bundle from the ACE, save the Admin running configuration and the user context running configurations to a remote server. When you remove a demo or permanent license bundle, the ACE removes all user contexts from the Admin running configuration. By removing the user contexts, their running and startup configurations are also removed from the ACE.

Restrictions

This topic includes the following restrictions:

- You must have the Admin role in the Admin context to remove the license file.
- The type of licenses currently installed on the ACE determines which license you can remove. Table 2-3 lists the currently installed license bundles, the current licensed features, and the remaining licensed features after the license is removed.

Table 2-3 Results of Removing License Bundles and Upgrade License Bundles

Installed License Bundle File	Current Licensed Features	Results of License Removal
ACE-4710-0.5-K9	0.5 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts	1 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts
ACE-4710-BUN-UPG1= ACE-4710-01-K9	1 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts	1 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts
ACE-4710-BUN-UPG2= ACE-4710-02-K9	2 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts	1 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts
ACE4710-BUN-UPG3= ACE-4710-04-K9	4 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts	2 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts
ACE-4710-2PAK	1 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts	1 Gbps bandwidth 2 Gbps compression 7500 TPS SSL 20 virtual contexts

Detailed Steps

Command	Purpose
license uninstall {*license_filename* | **all**} **Example:** host1/Admin# license uninstall disk0:ACE-4710-01-K9.lic	Removes a license bundle or all license bundles from the ACE. The argument and keyword are as follows: • *license_filename*—Specifies the filename of the license file that you want to remove. Enter the license filename as an unquoted text string with no spaces. • **all**—Removes all license files from the ACE and returns all current licensed features to their default values.

Follow these steps to remove a license:

Step 1 Save the Admin and user context running configurations to a remote server by entering the **copy running-config** command in Exec mode in each context. For more information on this command, see Chapter 4, Managing the ACE Software.

For example, to copy the Admin running configuration to an TFTP server as R-CONFIG-ADM, enter:

```
host1/Admin# copy running-config tftp://192.168.1.2/R-CONFIG-ADM
```

To copy the C1 user context running configuration to an TFTP server, access the C1 context and enter:

```
host1/C1# copy running-config tftp://192.168.1.2/R-CONFIG-C1
```

Step 2 Remove the license with the **license uninstall** command. For example, to remove the ACE30-MOD-04-K9.LIC license, enter:

```
host1/Admin# license uninstall disk0:ACE-4710-01-K9.lic
```

The ACE displays the following messages and prompt:

```
Clearing license ACE30-MOD-04-K9.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ACE30-MOD-04-K9.lic cisco 1.0 permanent 1 \
        VENDOR_STRING=<count>1</count> HOSTID=ANY \
        NOTICE="<LicFileID>20051103151315824</LicFileID><LicLineID>1</LicLineID> \
        <PAK></PAK>" SIGN=86A13B1EA2F2

INCREMENT ACE30-MOD-04-K9.lic cisco 1.0 permanent 1 \
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!! WARNING: Uninstalling virtual context license will automatically!!
!!! cleanup all the user context configurations, please backup the  !!
!!! configurations before proceeding further with uninstallation    !!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Do you want to continue? (y/n)
```

Step 3 If you have not saved the running configurations for the Admin and user contexts to a remote server, enter **n**. Go to Step 1.

If you saved the running configurations for the Admin and user contexts to a remote server, enter **y**.

During the license removal, the ACE removes the user context configurations from the Admin running configuration, causing the deletion of all user contexts including their running and startup configurations.

Step 4 Display the current number of supported contexts on the ACE by entering the **show license status** command in Exec mode of the Admin context.

Step 5 Determine which contexts you want to keep in the Admin running configuration. Using a text editor, manually remove the extra context configurations from the Admin running configuration on the remote server.

If the Admin running configuration contains more contexts than what the ACE supports and you copy this configuration to the ACE, the ACE rejects contexts that exceed the supported limit. For example, if the running configuration contains 20 contexts, when you remove the license, the ACE supports five contexts. If you attempt to copy the configuration with all 20 contexts, the ACE allows the first five contexts, fails the remaining contexts, and displays error messages on the console.

Note You can also manually recreate the user contexts in the running configuration that is currently on the ACE. If you do, go to Step 7.

Step 6 Retrieve the modified Admin running configuration from the remote server. For example, to copy the R-CONFIG-ADM Admin running configuration from the TFTP server, enter:

```
host1/Admin# copy tftp://192.168.1.2/R-CONFIG-ADM running-config
```

Step 7 Copy the Admin running configuration to the startup-configuration file. For example, enter:

```
host1/Admin# copy running-config startup-config
```

Note If you do not update the startup configuration with the latest running configuration, when the ACE restarts, it uses the startup configuration with the extra contexts. The ACE allows the number of contexts that the license supports, but fails the remaining contexts.

Step 8 Access the user context, and copy its running configurations from the remote server. For example, to copy the C1 user context running configuration from the TFTP server, access the C1 context and enter:

```
host1/C1# tftp://192.168.1.2/R-CONFIG-C1 copy running-config
```

Step 9 Copy the user context running configuration to the startup-configuration file. For example, enter:

```
host1/Admin# copy running-config startup-config
```

Step 10 Repeat Steps 8 and 9 until you retrieve the running configurations for all user contexts configured in the Admin configuration.

Downgrading the ACE Software to a Release Prior to A4(2.0)

Because the bundle licenses in software version A4(2.x) and later are not compatible with licenses from earlier releases, the number of virtual contexts that remain after the downgrade is five and all other contexts are lost. Therefore, you must back up all your configured contexts prior to downgrading the ACE software to a release earlier than A4(2.0). The ACE displays the following warning message during the downgrade procedure:

```
!!!
```

Detailed Steps

Command	Purpose
copy licenses disk0:[*path/*]*filename.tar* **Example:** host1/Admin# copy licenses disk0:mylicenses.tar	Backs up your license files to the ACE Flash disk as tar files. The keyword and argument are as follows: • **disk0:**—Specifies that the backup license file is copied to the disk0: file system. • [*path*/]*filename*.**tar**—Destination filename for the backup licenses. The destination filename must have a .tar file extension.

Retrieving an ACE License File

This section describes how retrieve an ACE license file. If you accidently remove or lose the license on the ACE, you can untar your backup license file and then reinstall it.

Restrictions

You must be in the Admin context to retrieve an ACE license file.

Detailed Steps

Command	Purpose
untar disk0:[*path/*]*filename.tar* **Example:** host1/Admin# untar disk0:mylicenses.tar	Untars the backup file should you need to reinstall it because you accidently removed or lost the license. The [*path*/]*filename*.**tar** argument is the filename of the .tar backup license file. For information on installing the license, see the "Installing a New or Upgrade License File" section.

Displaying ACE License Configurations and Statistics

To display license information about your ACE, perform one of the following tasks in the Admin context only:

Command	Purpose
show license [**brief** | **file** *filename* | **internal event-history** | **status** | **usage**]	Displays all or some of the license information. Entering this Exec mode command without any options and arguments displays all installed ACE license files and their contents. The options and arguments for this command are as follows: • **brief**—Displays a list of the currently installed licenses. • **file** *filename*—Displays the file contents of the specified license. • **internal event-history**—Displays a history of licensing-related events. • **status**—Displays the status of licensed features (see Table 2-4). • **usage**—Displays the usage table for all licenses (see Table 2-5).
show version	Displays license information.

Table 2-4 describes the fields in the **show license status** command output.

Table 2-4 Field Descriptions for the show license status Command Output

Field	Description
Licensed Feature	List including the ACE SSL transactions per second (TPS), virtual contexts, bandwidth, compression, and application acceleration and optimization concurrent connections.
Count	Number of ACE-supported SSL TPS, virtual contexts, bandwidth (Gbps), compression (Gbps), and application acceleration and optimization concurrent connections. This information also provides the default number of contexts, SSL TPS, and appliance bandwidth that the ACE supports when a license is not installed.

Table 2-5 describes the fields in the **show license usage** command output.

Table 2-5 Field Descriptions for the show license usage Command Output

Field	Description
License	Name of the license.
Ins	Whether the license is installed (Yes or No).
Lic Count	Number of licenses for this feature.
Status	Current state of the feature (In use or Unused).
Expiry Date	Date when the demo license expires, as defined in the license file. If the license is permanent, this field displays Never.
Comments	Licensing errors, if any.